AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Presently amended) A space cross-connect unit (Z) with N input ports (E_i) and P output ports (S_i), comprising:

a broadcast stage comprising at most N signal dividers (A_i) each having one input and C outputs where C is an integer factor of P less than P, each input being connected to one of said N input ports (E_i) so that each of said N dividers (A_i) divides a signal received at one of said N input ports (E_i) into C signals at said C outputs, and

a space switching stage comprising at most C space switching modules (B_i, B'_i),

~~which~~said space cross-connect unit is characterized in that:

the [[C]] space switching modules (B_i, B'_i) are non-blocking and non-broadcasting, and

each of said [[C]]space switching modules (B_i, B'_i) has N inputs and P/C outputs, said N inputs are connected to N outputs of said broadcast stage, each of said N outputs comes from a different divider (A_i), and each of said P/C outputs of said [[C]]space switching modules (B_i, B'_i) is connected to a respective one of said P output ports (S_i), wherein said space cross-connect unit is configured for packet switching and circuit switching, and wherein said space cross-connect unit is adapted to provide broadcasting of input signals independently of spectral considerations.

2. (Original) A cross-connect unit (Z) according to claim 1, comprising exactly N dividers (A_i) and C modules (B_i, B'_i).

3. (Presently Amended) A cross-connect unit (Z) according to claim 1, characterized in that each of said [[C]]space switching modules (B_i, B'_i) comprises means for connecting each of its N inputs to one of its P/C outputs.

4. (Presently Amended) A cross-connect unit (Z) according to claim 1, characterized in that each of said [[C]]space switching switching modules (B_i, B'_i) is a non-blocking switching matrix (B_i) with N inputs and P/C outputs.

5. (Presently Amended) A cross-connect unit (Z) according to claim 1, characterized in that each of said [[C]]space switching switching modules (B'_i) comprises:

K non-blocking switching matrices (F_i) with N/K inputs and P/C outputs, where K is an integer factor of N; and

P/C non-blocking switching matrices (G_i) with K inputs and one output, each of said K inputs being connected to a respective output of each of said K switches (Fi).

6. (Presently Amended) A cross-connect unit (Z) according to claim 1, characterized in that at least one of said [[C]]space switching switching modules (B'_i) comprises:

K non-blocking switching matrices (F_i) with N/K inputs and P/C outputs, where K is an integer factor of N; and

P/C non-blocking switching matrices (G_i) with K inputs and one output, each of said K inputs being connected to a respective output of each of said K switches (F_i).

7. (Presently Amended) A cross-connect unit (Z) according to claim [[1]]5, characterized in that said P/C switching matrices (G_i) are semiconductor optical amplifier (SOA) switches.

8. (Original) A cross-connect unit (Z) according to claim 1, characterized in that said number N of input ports is equal to said number P of output ports.

9. (Original) A cross-connect unit (Z) according to claim 5, characterized in that K is equal to C.

10. (Original) A cross-connect unit (Z) according to claim 1, characterized in that said switching stage uses a technology based on $LiNbO_3$.

11. (Presently Amended) A cross-connect unit (Z) according to claim 1, characterized in that each of said P/C outputs of said [[C]]space switching modules (B_i, B'_i) is followed by an amplifier (D_S).

12. (Presently Amended) A cross-connect unit according to claim 1, characterized in that ~~each of said N inputs of said N dividers~~the input of each divider is preceded by an amplifier (D_E).

13. (Presently Amended) A cross-connect unit (Z) according to claim 1, characterized in that each of said space switching modules (B_i, B'_i) comprises:

a first stage comprising polarization-maintaining space switching matrices (M_1, …, M_K); and

a second stage comprising polarization-maintaining semiconductor optical amplifiers ~~($MQWSOPA_1$, …, $MQWSOA_k$)~~($MQWSOA_1$, …, $MQWSOA_k$).

14. (Previously Presented) A signal transmission system comprising a cross-connect unit (Z) according to claim 1 and characterized in that said system comprises:

at least one multiplexer for multiplexing M signals having M different wavelengths $(\lambda_i)_{1\leq i\leq M}$, where M is an integer less than or equal to N;

at least one erbium-doped fiber amplifier (EDFA) for amplifying the multiplexed signal; and

at least one demultiplexer for demultiplexing the multiplexed signal to yield M demultiplexed signal that are input to M input ports of said cross-connect unit.

15. (New) A cross-connect unit (Z) according to claim 6, characterized in that said P/C switching matrices (G_i) are semiconductor optical amplifier (SOA) switches.

16. (New), The cross-connect unit of claim 1, wherein said number of dividers is less than N.